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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/585,704	03/28/2008	Alexander Cerge Shkolnik	2972/103	4311
2101 7590 06/15/2011 Sunstein Kann Murphy & Timbers LLP 125 SUMMER STREET BOSTON, MA 02110-1618				
EXAMINER				
TRIEU, THAI BA				
ART UNIT		PAPER NUMBER		
3748				
NOTIFICATION DATE		DELIVERY MODE		
06/15/2011		ELECTRONIC		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

PATENTS@SUNSTEINLAW.COM

### Office Action Summary

**Application No.**

10/585,704

**Applicant(s)**

SHKOLNIK ET AL.

**Examiner**

THAI BA TRIEU

**Art Unit**

3748

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 02 June 2011.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 37-44 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 37-44 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 July 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-945)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 10/09/2007 and 02/22/2011
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

### **DETAILED ACTION**

Applicant's election of Group I and Species of Figures 1-2 in combination with Figures 41-42 in the reply filed on 06/02/2011 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Claims 1-36 were cancelled; and

Claims 37-44 were newly added.

### ***Information Disclosure Statement***

The listing of references in the specification is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents (*See Paragraph [0047]*), publications (*See Paragraphs [0037] and [0047]*), or other information submitted for consideration by the Office, and MPEP § 609.04(a) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered.

### ***Drawings***

The drawings are objected to because **Figure 42** is not clearly seen. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing

sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Claim Objections***

Claims 38-39 are objected to because of the following informalities:

Claims 38-39 should be revised as a method format.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 37 and its dependent claims 38-44 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Specifically,

In Claim 37, the recitation of ***“while maintaining substantially constant volume”*** renders the claim indefinite, since it is not clear that by which way(s) or by which configuration of the engine component(s) is/are affected on maintaining volume at substantially constant? Applicants are required to clarify or to revise the claimed limitation.

In Claim 37, the recitation of ***“in a manner that is smooth and continuous”*** renders the claim indefinite, since it is not clear that which component(s) of the engine, such as volume size, shaft rotation, the phases, etc..., is/are to be considered in smooth and continuous manner? Applicants are required to clarify or to revise the claimed features.

Claim 37 and its dependent claims 38-44 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential elements, such omission amounting to a gap between the elements. See MPEP § 2172.01. The omitted elements are: exhaust port for discharging exhaust gas out of the engine.

Claim 40, the recitation of "maintaining conditions under which the fuel undergoes spontaneously ignition" renders the claim indefinite, since it is not clear that which condition(s) is/are to be maintained? By which way(s)/method(s) the conditions are to be maintained? Applicants are required to identify the condition(s) and the way(s)/method(s) for maintaining conditions in order the fuel undergoes spontaneous ignition.

***Claim Rejections - 35 USC § 101***

Claim 37 and it dependent claims 38-44 are rejected under 35 U.S.C. 101 because the disclosed invention is inoperative and therefore lacks utility.

Claim 37 provides a method of operating an internal combustion engine, having a housing, a piston, a shaft, and an intake port for introducing working medium, is operating through phases of compression combustion and expansion. However, the engine has no exhaust port for discharging exhaust gas out of the engine. Therefore, this engine is inoperative and lacks utility.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

***Claims 37-39 are rejected under 35 U.S.C. 102(b) as best understood as being anticipated by Lionel Montalvo Morales (Pub. Number DT 24 38 410 A1).***

The method as claimed would be inherent during the normal use and operation of Lionel Montalvo Morales device.

Lionel Montalvo Morales discloses a method of operating an internal combustion engine, the method comprising:

providing, in a housing (88b), a piston (70, 72) and a shaft (65, 73), wherein over a course of rotation of the shaft (65, 73) there are successively defined volumes in differing amounts within the housing (88) for phases of compression (A) , combustion (B), and expansion (C) (See Figures 24-45, Page 16, lines 14-22, and Page 17, lines 1-14 of a certified English translation copy),

causing compression of a working medium, introduced through an intake port, by reducing volume in the compression phase from an initial volume to a second volume that is less than the initial volume (See Figures 27-29, Page 16, lines 5-13 of a certified English translation copy);

causing combustion, in the combustion phase, while maintaining substantially constant volume, of fuel (102) that has been introduced through a fuel port into the working medium (See Figure 22, Page 14, lines 5-12 of a certified English translation copy); and

undergoing expansion, in the expansion phase, of gases from combustion while the volume increases to a third volume that is larger than the initial volume (See Figure 23, Page 14, lines 5-8 of a certified English translation copy);

wherein volume size varies, if at all, over the course of shaft rotation, defining successively volumes in differing amounts for phases of compression, combustion, and expansion, in a manner that is smooth and continuous (See Column 10, lines 19-22 of a certified English translation copy);

**(Re. Cl. 38)** wherein the working medium is selected from the group consisting of air and a mixture of air and fuel (See Page 16, lines 5-6 of a certified English translation copy);

**(Re. Cl. 39)** wherein the fuel has been introduced after the working medium has been compressed to the second volume (See Page 5, lines 16-17, Page 11, lines 19-20, Claim 1, lines 17-18).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

***Claim 40 is rejected under 35 U.S.C. 103(a) as best understood as being unpatentable over Lionel Montalvo Morales (Pub. Number DT 24 38 410 A1), in view of Dunlap et al. (Patent Number 3,845,745).***

Lionel Montalvo Morales discloses the invention as recited above, however fails to disclose maintaining conditions under which the fuel undergoes spontaneous ignition.



Dunlap teaches that it is conventional in the art of internal combustion engines, to utilize injection water into the intake manifold/air-and-fuel mixture in order to maintain conditions under which the fuel undergoes spontaneous ignition (See Column 2, lines 7-55).

It would have been obvious to one having ordinary skill in the art at that time the invention was made, to have utilized maintaining conditions under which the fuel undergoes spontaneous ignition by injecting water, as taught by Dunlap, to improve the efficiency of the Lionel Montalvo Morales device, since the use thereof would have prevented spontaneous ignition causing by the high temperature of the combustion chambers.

***Claim 41-43 are rejected under 35 U.S.C. 103(a) as best understood as being unpatentable over Lionel Montalvo Morales (Pub. Number DT 24 38 410 A1), in view of Dunlap et al. (Patent Number 3,845,745), and further in view of Tsubuchi (Patent Number 4,059,086).***

The modified Lionel Montalvo Morales device discloses the invention as recited above, however fails to disclose an energy recovery system.

Tsubouchi teaches that it is conventional in the art of internal combustion engines having fuel and lubricating oil supply device, to have (Re. Cl. 41) an energy recovery system (14) to increase the heat of combustion of the fuel medium before it is introduced to the fuel port (See Figures 1-3); and (Re. Cl. 42) the energy recovery system (14) additionally to reduce the temperature of the gases from combustion (See

Figures 1-3, Column 2, lines 23-49); (Re. Cl. 43) the energy recovery systems including causing thermo-chemical decomposition of gaseous fuel (See Abstract).

It would have been obvious to one having ordinary skill in the art at that time the invention was made, to have had an energy recovery system, as taught by Tsubuchi, to improve the efficiency of the modified Lionel Montalvo Morales device, since the use thereof would have had fuel being gasified thoroughly before being delivered into the engine.

***Claims 43-44 are rejected under 35 U.S.C. 103(a) as best understood as being unpatentable over Lionel Montalvo Morales (Pub. Number DT 24 38 410 A1), in view of Dunlap et al. (Patent Number 3,845,745), and further in view of Shkolnik (Pub. Number WO 03/74840 A2).***

The modified Lionel Montalvo Morales device discloses the invention as recited above, however fails to disclose an energy recovery system including (Re. Cl. 43) causing thermo-chemical decomposition of gaseous fuel and (Re. Cl. 44) causing a catalyst-assisted reaction occurring at a constant temperature between 450 degrees C and 750 degrees C.

Shkolnik teaches that it is conventional in the art of internal combustion engines to have an energy recovery system including (Re. Cl. 43) causing thermo-chemical decomposition of gaseous fuel and (Re. Cl. 44) causing a catalyst-assisted reaction occurring at a constant temperature between 450 degrees C and 750 degrees C (See page 21, lines 1-28).

It would have been obvious to one having ordinary skill in the art at that time the invention was made, to have had the energy recovery system, as taught by Shkolnik, to improve the efficiency and to reduce the exhaust emissions --the amount of NO<sub>x</sub> and unburned hydrocarbons-- for the modified Lionel Montalvo Morales device.

### ***Prior Art***

The information disclosure statements (PTO-1449) submitted on **09 October 2007** and **22 February 2011** have been acknowledged and placed in the file. The submissions are in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statements have been considered by the examiner. Each initialized copy is attached hereto.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to THAI BA TRIEU whose telephone number is (571)272-4867. The examiner can normally be reached on Monday - Thursday (6:30-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas E. Denion can be reached on (571) 272-4859 or Kenneth Bomberg

can be reached on (571) 272-4922. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

TTB  
June 7, 2011

/Thai-Ba Trieu/  
Primary Examiner  
Art Unit 3748